



# ATMO sphere

Business Case for  
Natural Refrigerants

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GODREJ – A HYDROCARBON EXPERIENCE

A.A.ACHAREKAR



## Introduction

- Who we are...
  - Godrej & Boyce Mfg. Co. Ltd - The Flagship Company of the Godrej Group
  - Into Business since 1897
  - One of the largest privately held Industrial Corporations
  - Annual Turnover of Rs. 3200 Crores (approx.) for FY 2017-18
  - All India presence with 20 Branches & 51 Showrooms
  - Family of 11000 + employees



## Background – The trigger

- Decision of the 19<sup>th</sup> MOP to the Montreal Protocol - Accelerated phase out of HCFCs.
- German Ministry of Environment under its International Climate Initiative through GIZ invited Indian air-conditioner manufacturers to participate in a project on HC-290 to reduce greenhouse gas emissions.

Godrej responded to the call...

## Selection Process

- Godrej successfully introduced 100% CFC free R600a Refrigerant based Refrigerators in 2000.
- Godrej was first & only Indian company to shift to Hydrocarbon-based refrigerant in refrigerators. More than ten million refrigerators in field over almost 2 decades.

## Selection Process - Choices

Alternatives to R22:

- R32
- R410a
- R290

Refrigerant	GWP	ODP	Flammability as per ASHRAE
R22	1810	0.055	Non-flammable
R410a	2090	0	Non-flammable
R32	675	0	A2L
R290	3	0	A3



## R290 as a refrigerant in Split AC

- Advantages of R290
  - High Efficiency
  - Zero ODP
  - Low GDP
  
- Challenges in handling R290
  - Charge limit : EN378
  - Cooling System Components for R290 : Compressors, Heat exchangers
  - Safety Concerns : High flammability (A3 as per ASHRAE)
  - Service Personnel Training



## The Manufacturing Project

- Tripartite agreement, Ozone Cell/GIZ/Godrej – Dec 2010 – to set up manufacturing facility for annual output of 180,000 Split and Window type Air-conditioners
  - Equipment Specifications, Tendering – June 2011
  - Equipment Delivery – Dec 2011
  - Installation & Commissioning – Jan ~ March 2012
  - TuV Audit of Manufacturing Line – March 2012
  - BEE Certification – March 2012
  - Pilot Production - April 2012
  
- In 2012, Godrej became first company in the world to use R290 refrigerant in Air-conditioner & successfully doing so till date.



## Range of Godrej R290 Split AC

- Fixed Speed Split AC Range
  - 1T 3-Star Split AC
  - 1.5T 3-Star Split AC
  
- Variable Speed (Inverter) Split AC Range
  - 1T 3-Star, 4-Star, 5-Star, **8-Star level Split AC**
  - 1.5T 3-Star, 4-Star, 5-Star Split AC
  - 2T 5-Star Split AC





## Range of Godrej R290 Split AC

- Fixed Speed Split AC



AC Cooling Capacity : 3375W  
Compressor details : Rotary  
Power Supply : 230/1/50 (V/Phase/Hz)  
Power Input : 912W  
ISEER : 3.7  
Star Rating : 3 Star



AC Cooling Capacity : 4900W  
Compressor details : Rotary  
Power Supply : 230/1/50 (V/Phase/Hz)  
Power Input : 1325W  
ISEER : 3.7  
Star Rating : 3 Star

For a complete list of products, visit our website <http://www.godrejappliances.com>



## Range of Godrej R290 Split AC

- Inverter Split AC



AC Cooling Capacity : 3500W  
Compressor details : Twin Rotary  
Power Supply : 230/1/50 (V/Phase/Hz)  
Power Input : 761W  
ISEER : 6.15  
Star Rating : 8 Star



AC Cooling Capacity : 5300W  
Compressor details : Twin Rotary  
Power Supply : 230/1/50 (V/Phase/Hz)  
Power Input : 1380W  
ISEER : 5.20  
Star Rating : 6 Star

For a complete list of products, visit our website <http://www.godrejappliances.com>



## Godrej R290 Split AC Exports

### Markets in 2017

- Maldives
- Nepal + Training
- Grenada
- Bhutan + Training
- Philippines

### Markets in 2018

- Costa rica
- Thailand

### In the pipeline

- Australia
- Sri Lanka
- B'desh



## Godrej R290 Split AC

- Over 600,000 satisfied customers
- 4500+ well trained technicians across the country
- Training imparted in Nepal, Bhutan, Bangladesh

**GODREJ IS COMMITTED TO  
GOOD & GREEN PRODUCTS**



Thank you for listening!

